Flexoelectric liquid cristal device.

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Abstract

A liquid crystal device includes a liquid crystal material (30) in which the molecules (15) form a helix having its axis essentially parallel to the plates (13,20) of the device. A suitable electric field (E), applied essentially perpendicular to the plates, causes planes of the directors (n) to rotate about the field direction to an acute angle phi with respect to the helix axis, thereby inducing alternating bands of splay and bend in the material. Such configurations, which have polar symmetry, give rise to the flexoelectric effect in which the polarization (P) of the molecules tends to be parallel to the applied field, and the magnitude of the field is linearly related to tan phi . The ability to rotate the directors means that the optical properties of the material can be changed.

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